TRANSMITTAL OF APPEAL BRIEF (Large Entity)	Docket No. ITL.1022US

In Re Application Of: **Justin K. Brask, et al.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10,626,336	July 24, 2006	Ori Nadav	21906	2811	1387

Invention: **Forming a High Dielectric Constant Film Using Metallic Precursor**

COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on **April 10, 2006**

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Dated: **June 29, 2006**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:	Justin K. Brask, et al.	Art Unit:	2811
Serial No.:	10/626,336	Examiner:	Ori Nadav
Filed:	July 24, 2003	Atty Docket:	ITL.1022US (P16709)
For:	Forming a High Dielectric Constant Film Using Metallic Precusor	Assignee:	Intel Corporation

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APPEAL BRIEF

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TABLE OF CONTENTS

REAL PARTY IN INTEREST

The real party in interest is the assignee Intel Corporation.

RELATED APPEALS AND INTERFERENCES

None.

STATUS OF CLAIMS

Claims 1-6 (Canceled).

Claim 7 (Rejected).

Claim 8 (Canceled).

Claims 9-13 (Rejected).

Claims 14-26 (Canceled).

Claims 7 and 9-13 are rejected and are the subject of this Appeal Brief.

STATUS OF AMENDMENTS

All amendments have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

In the following discussion, the independent claims are read on one of many possible embodiments without limiting the claims:

7. A method comprising:

forming a metallic precursor (12) directly on a semiconductor substrate (Specification at page 2, line 18-page 3, line 2); and

oxidizing said metallic precursor (12A) using a liquid oxidizer (Specification at page 3, lines 3-13).

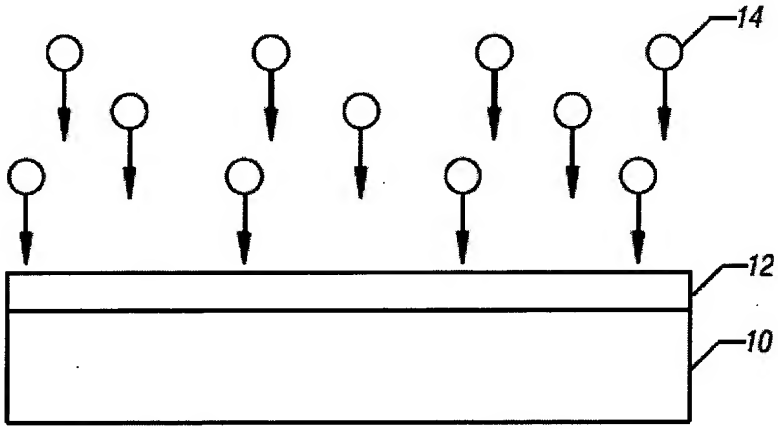

FIG. 1

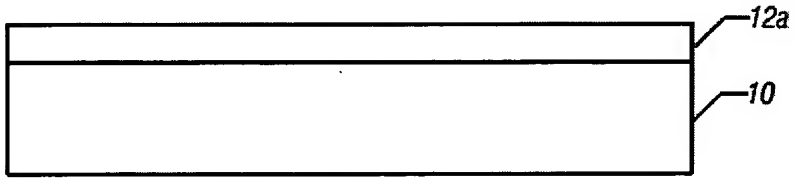

FIG. 2

At this point, no issue has been raised that would suggest that the words in the claims have any meaning other than their ordinary meanings. Nothing in this section should be taken as an indication that any claim term has a meaning other than its ordinary meaning.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Are claims 7 and 9-12 anticipated by Hwu?

ARGUMENT

A. Are claims 7 and 9-12 anticipated by Hwu?

The Office action suggests the Hwu teaches using a liquid oxidizer. While he does use a liquid, it is clear and explicitly stated in Hwu that that liquid is an electrolyte. See column 3, line 33.

An electrolyte is not a liquid oxidizer. Instead the oxidation is the result of liquid phase anodic oxidation. See column 3, line 30. An "electrolyte" is a chemical compound which when molten or dissolved in certain solvents, usually water, will conduct an electrical current. See McGraw-Hill Dictionary of Scientific and Technical Terms attached. Plainly an electrolyte and a liquid oxidizer are two very different things.

A search of the patent database indicates that the only patent that uses the phrase "liquid phase anodic oxidation" is the one currently cited. An "anodic reaction" however is a reaction in the mechanism of electrochemical corrosion in which the metal forming the anode dissolves in the electrolyte in the form of positively charged ions. See McGraw-Hill Dictionary attached. The same dictionary defines "electrolysis" as a method by which chemical reactions are carried out by passage of electric current through a solution of electrolyte or a molten salt. See copy attached.

What causes the oxidation in the cited reference is electrical current passing through the electrolyte which itself is not an oxidizer. The same dictionary defines an "oxidizing agent" as "a compound that gives up oxygen easily, removes hydrogen from another compound or tracks negative electrons". See copy attached.

An electrolyte does not do any of these things. While electricity might do such things, electricity is not a liquid oxidizer. In short, there is no justifiable way to assert that use of an electrolytic reaction teaches the use of a liquid oxidizer.

Therefore, the rejection should be reversed.

Applicant respectfully requests that each of the final rejections be reversed and that the claims subject to this Appeal be allowed to issue.

Respectfully submitted,

Date: June 29, 2006

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Attorneys for Intel Corporation

CLAIMS APPENDIX

The claims on appeal are:

7. A method comprising:
forming a metallic precursor directly on a semiconductor substrate; and
oxidizing said metallic precursor using a liquid oxidizer.

9. The method of claim 7 using an oxidizer in an aqueous solution.

10. The method of claim 7 including forming a metal oxide dielectric over a silicon substrate.

11. The method of claim 10 including forming a metal oxide dielectric of hafnium, zirconium, or tantalum.

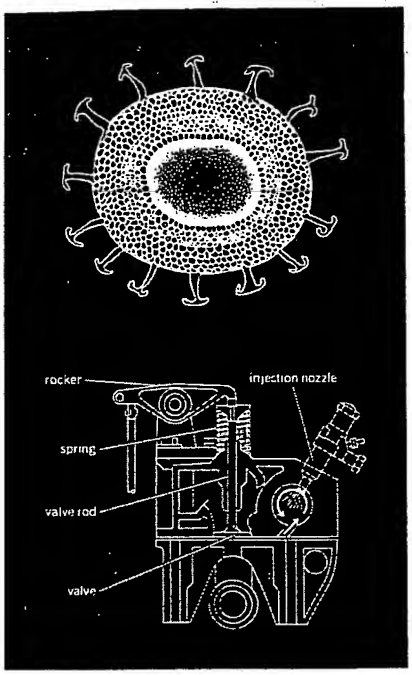
12. The method of claim 7 including depositing a metallic film using physical vapor deposition.

13. The method of claim 7 including oxidizing using a liquid oxidizer selected from the group including solutions of O_3, H_2O_2, and organic peroxide.

EVIDENCE APPENDIX

See the following entry from the McGraw-Hill Dictionary of Scientific and Technical Terms.

McGraw-Hill Dictionary of Scientific and Technical Terms



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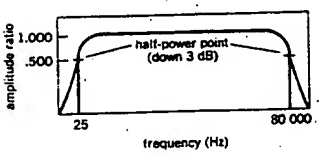
ELECTROKINETIC TRANSDUCER



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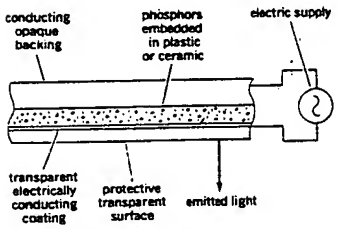

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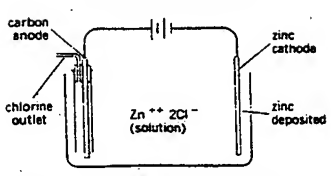

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electrolyte [PHYS CHEM] A chemical compound which when molten or dissolved in certain solvents, usually water, will conduct an electric current.

electrolyte acid *See* sulfuric acid.

electrolyte-activated battery [ELEC] A reserve battery in which an aqueous electrolyte is stored in a separate chamber, and a mechanism, which may be operated from a remote location, drives the electrolyte out of the reservoir and into the cells of the battery for activation.

electrolytic analysis [ANALY CHEM] Basic electrochemical technique for quantitative analysis of conducting solutions containing oxidizable or reducible material; measurement is based on the weight of material plated out onto the electrode.

electrolytic arrester *See* aluminum-cell arrester.

electrolytic brightening *See* electropolishing.

electrolytic capacitor [ELEC] A capacitor consisting of two electrodes separated by an electrolyte; a dielectric film, usually a thin layer of gas, is formed on the surface of one electrode. Also known as electrolytic condenser.

electrolytic cell [PHYS CHEM] A cell consisting of electrodes immersed in an electrolyte solution, for carrying out electrolysis.

electrolytic cleaning *See* electrochemical cleaning.

electrolytic condenser *See* electrolytic capacitor.

electrolytic conductance [PHYS CHEM] The transport of electric charges, under electric potential differences, by charged particles (called ions) of atomic or larger size.

electrolytic conductivity [PHYS CHEM] The conductivity of a medium in which the transport of electric charges, under electric potential differences, is by particles of atomic or larger size.

electrolytic copper [MET] Metallic copper produced by electrochemical deposition from a copper ion-containing electrolyte.

electrolytic corrosion *See* electrochemical corrosion.

electrolytic deposition *See* electrodeposition.

electrolytic dissociation [CHEM] The ionization of a compound in a solution.

electrolytic etching [MET] Engraving the surface of a metal by electrolysis.

electrolytic grinding [MECH ENG] A combined grinding and machining operation in which the abrasive, cathodic grinding wheel is in contact with the anodic workpiece beneath the surface of an electrolyte.

electrolytic interrupter [ELEC] An interrupter that consists of

anode of an electron tube because of bombardment by electrons and ions.

anode effect [PHYS CHEM] A condition produced by polarization of the anode in the electrolysis of fused salts and characterized by a sudden increase in voltage and a corresponding decrease in amperage.

anode efficiency [ELECTR] The ratio of the ac load circuit power to the dc anode power input for an electron tube. Also known as plate efficiency.

anode fall [ELECTR] A very thin space-charge region in front of an anode surface, characterized by a steep potential gradient through the region.

anode film [CHEM] The portion of solution in immediate contact with the anode.

anode furnace [MET] A furnace in which blister copper or impure nickel is refined.

anode impedance [ELECTR] Total impedance between anode and cathode exclusive of the electron stream. Also known as plate impedance; plate-load impedance.

anode input power [ELECTR] Direct-current power delivered to the plate (anode) of a vacuum tube by the source of supply. Also known as plate input power.

anode metal [MET] The metal used as anode in an electroplating process.

anode modulation [ELECTR] Modulation produced by introducing the modulating signal into the anode circuit of any tube in which the carrier is present. Also known as plate modulation.

anode mud [MET] An insoluble substance or mixture that collects at the anode in an electrolytic refining or plating process. Also known as anode slime.

anode neutralization [ELECTR] Method of neutralizing an amplifier in which the necessary 180° phase shift is obtained by an inverting network in the plate circuit. Also known as plate neutralization.

anode pulse modulation [ELECTR] Modulation produced in an amplifier or oscillator by application of externally generated pulses to the plate circuit. Also known as plate-pulse modulation.

anode rays [ELECTR] Positive ions coming from the anode of an electron tube; generally due to impurities in the metal of the anode.

anode resistance [ELECTR] The resistance value obtained when a small change in the anode voltage of an electron tube is divided by the resulting small change in anode current. Also known as plate resistance.

anode saturation [ELECTR] The condition in which the anode current of an electron tube cannot be further increased by increasing the anode voltage; the electrons are then being drawn to the anode at the same rate as they are emitted from the cathode. Also known as current saturation; plate saturation; saturation; voltage saturation.

anode scrap [MET] Portions of anode copper retrieved from electrolytic refining of the metal.

anode sheath [ELECTR] The electron boundary which exists in a gas-discharge tube between the plasma and the anode when the current demanded by the anode circuit exceeds the random electron current at the anode surface.

anode slime *See* anode mud.

anodic [PHYS] Pertaining to the anode.

anodic cleaning [MET] The removal of a foreign substance from a metallic surface by electrolysis with the metal as the anode. Also known as anodic pickling; reverse-current cleaning.

anodic coating [MET] A film of oxide produced on a metal by electrolysis with the metal as the anode.

anodic pickling *See* anodic cleaning.

anodic polarization [PHYS CHEM] The change in potential of an anode caused by current flow.

anodic reaction [MET] The reaction in the mechanism of electrochemical corrosion in which the metal forming the anode dissolves in the electrolyte in the form of positively charged ions.

anodize [MET] The formation of a decorative or protective passive film on a metal part by making it the anode of a cell and applying electric current.

anodized aluminum [MET] Aluminum coated with a layer of aluminum oxide by an anodic process in a suitable electrolyte such as chromic acid or sulfuric acid solution.

anodized magnesium [MET] An anodic coating on magnesium produced in one of various electrolytes, mainly of fluorides, phosphates, or chromates.

anole [VERT ZOO] Any arboreal lizard of the genus *Anolis*, characterized by flattened adhesive digits and a prehensile outer toe.

anolyte [CHEM] The part of the electrolyte at or near the anode that is changed in composition by the reactions at the anode.

Anomalinacea [INV ZOO] A superfamily of marine and benthic sarcodinian protozoans in the order Foraminiferida.

anomalistic month [ASTRON] The average period of revolution of the moon from perigee to perigee, a period of 27 days 13 hours 18 minutes 33.2 seconds.

anomalistic period [ASTRON] The interval between two successive perigee passages of a satellite in orbit about a primary. Also known as perigee-to-perigee period.

anomalistic year [ASTRON] The period of one revolution of the earth about the sun from perihelion to perihelion; 365 days 6 hours 13 minutes 53.0 seconds in 1900 and increasing at the rate of 0.26 second per century.

anomaloscope [OPTICS] An optical instrument for testing color vision, in which a yellow light whose intensity may be varied is matched against red and green lights whose intensity is fixed.

anomalous [SCI TECH] Deviating from the normal; irregular.

anomalous dispersion [OPTICS] Extraordinary behavior in the curve of refractive index versus wavelength which occurs in the vicinity of absorption lines or bands in the absorption spectrum of a medium.

anomalous magma [GEOL] Magma formed or obviously changed by assimilation.

anomalous magnetic moment [PARTIC PHYS] The difference between the observed magnetic moment and the value predicted by Dirac's theory.

anomalous water *See* polywater.

anomalous Zeeman effect [SPECT] A type of splitting of spectral lines of a light source in a magnetic field which occurs for any line arising from a combination of terms of multiplicity greater than one; due to a nonclassical magnetic behavior of the electron spin.

Anomaluridae [VERT ZOO] The African flying squirrels, a small family in the order Rodentia characterized by the climbing organ, a series of scales at the root of the tail.

anomaly [ASTRON] In celestial mechanics, the angle between the radius vector to an orbiting body from its primary (the focus of the orbital ellipse) and the line of apsides of the orbit, measured in the direction of travel, from the point of closest approach to the primary (perifocus). Also known as true anomaly. [BIOL] An abnormal deviation from the characteristic form of a group. [GEOL] A local deviation from the general geological properties of a region. [MED] Any part of the body that is abnormal in position, form, or structure. [METEOROL] The deviation of the value of an element (especially temperature) from its mean value over some specified interval. [OCEANOGR] The difference between conditions actually observed at a serial station and those that would have existed had the water all been of a given arbitrary temperature and salinity.

anomaly of geopotential difference *See* dynamic-height anomaly.

anomer [ORG CHEM] One of a pair of isomers of cyclic carbohydrates; resulting from creation of a new point of symmetry when a rearrangement of the atoms occurs at the aldehyde or ketone position.

anomite [MINERAL] A variety of biotite different only in optical orientation.

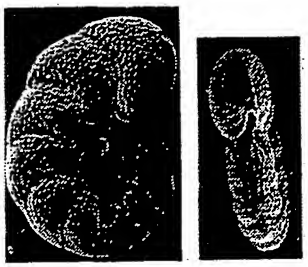
Anomocoela [VERT ZOO] A suborder of toadlike amphibians in the order Anura characterized by a lack of free ribs.

anomocoelous [ANAT] Describing a vertebra with a centrum that is concave anteriorly and flat or convex posteriorly.

Anomphalacea [PALEON] A superfamily of extinct gastropod mollusks in the order Aspidobranchia.

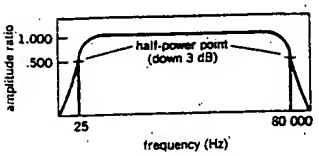
Anomura [VERT ZOO] A section of the crustacean order Decapoda that includes lobsterlike and crablike forms.

ANOMALINACEA



Scanning electron micrograph of the foraminiferan *Holmanella*, from the Miocene of California. (*a*) Spiral view and (*b*) edge views of bievolute planispiral test, with a coarsely perforate granular margin, and a slitlike aperture extending up the terminal face. *(R. B. MacAdam, Chevron Oil Field Research Co.)*

ELECTROKINETIC TRANSDUCER



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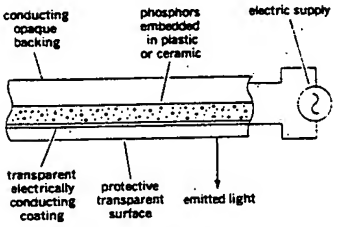

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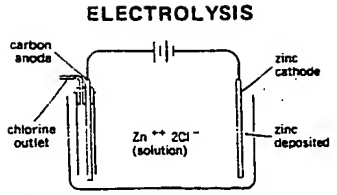

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electrolyte [PHYS CHEM] A chemical compound which when molten or dissolved in certain solvents, usually water, will conduct an electric current.

electrolyte acid *See* sulfuric acid.

electrolyte-activated battery [ELEC] A reserve battery in which an aqueous electrolyte is stored in a separate chamber, and a mechanism, which may be operated from a remote location, drives the electrolyte out of the reservoir and into the cells of the battery for activation.

electrolytic analysis [ANALY CHEM] Basic electrochemical technique for quantitative analysis of conducting solutions containing oxidizable or reducible material; measurement is based on the weight of material plated out onto the electrode.

electrolytic arrester *See* aluminum-cell arrester.

electrolytic brightening *See* electropolishing.

electrolytic capacitor [ELEC] A capacitor consisting of two electrodes separated by an electrolyte; a dielectric film, usually a thin layer of gas, is formed on the surface of one electrode. Also known as electrolytic condenser.

electrolytic cell [PHYS CHEM] A cell consisting of electrodes immersed in an electrolyte solution, for carrying out electrolysis.

electrolytic cleaning *See* electrochemical cleaning.

electrolytic condenser *See* electrolytic capacitor.

electrolytic conductance [PHYS CHEM] The transport of electric charges, under electric potential differences, by charged particles (called ions) of atomic or larger size.

electrolytic conductivity [PHYS CHEM] The conductivity of a medium in which the transport of electric charges, under electric potential differences, is by particles of atomic or larger size.

electrolytic copper [MET] Metallic copper produced by electrochemical deposition from a copper ion-containing electrolyte.

electrolytic corrosion *See* electrochemical corrosion.

electrolytic deposition *See* electrodeposition.

electrolytic dissociation [CHEM] The ionization of a compound in a solution.

electrolytic etching [MET] Engraving the surface of a metal by electrolysis.

electrolytic grinding [MECH ENG] A combined grinding and machining operation in which the abrasive, cathodic grinding wheel is in contact with the anodic workpiece beneath the surface of an electrolyte.

electrolytic interrupter [ELEC] An interrupter that consists of

and printout can be achieved by electrostatic printing techniques.

ovonic device *See* glass switch.

ovonic memory switch [ELECTR] A glass switch which, after being brought from the highly resistive state to the conducting state, remains in the conducting state until a current pulse returns it to its highly resistive state. Abbreviated OMS.

ovonic threshold switch [ELECTR] A glass switch which, after being brought from the highly resistive state to the conducting state, returns to the highly resistive state when the current falls below a holding current value. Abbreviated OTS.

ovotesticular hermaphroditism [MED] A rare form of hermaphroditism in which an ovotestis is present on one or both sides.

ovoviviparous [VERT ZOO] Producing eggs that develop internally and hatch before or soon after extrusion.

Ovshinsky effect [ELECTR] The characteristic of a special thin-film solid-state switch that responds identically to both positive and negative polarities so that current can be made to flow in both directions equally.

ovulation [PHYSIO] Discharge of an ovum or ovule from the ovary.

ovule [BOT] A structure in the ovary of a seed plant that develops into a seed following fertilization.

ovum [CYTOL] A female gamete. Also known as egg.

O-wave component *See* ordinary-wave component.

Owen bridge [ELECTR] A four-arm alternating-current bridge used to measure self-inductance in terms of capacitance and resistance; bridge balance is independent of frequency.

Owenlidae [INV ZOO] A family of limivorous polychaete annelids of the Sedentaria.

owl [VERT ZOO] Any of a number of diurnal and nocturnal birds of prey composing the order Strigiformes; characterized by a large head, more or less forward-directed large eyes, a short hooked bill, and strong talons.

OW unit *See* sabin.

oxalate [ORG CHEM] Salt of oxalic acid; contains the $(COO)_2$ radical; examples are sodium oxalate, $Na_2C_2O_4$, ammonium oxalate, $(NH_4)_2C_2O_4 \cdot H_2O$, and ethyl oxalate, $C_2H_5(C_2O_4)C_2H_5$.

oxaldehydic acid *See* glyoxalic acid.

oxalic acid [ORG CHEM] $HOOCCOOH \cdot 2H_2O$ Poisonous, transparent, colorless crystals melting at 187°C; soluble in water, alcohol, and ether; used as a chemical intermediate and a bleach, and in polishes and rust removers.

Oxalidaceae [BOT] A family of dicotyledonous plants in the order Geraniales, generally characterized by regular flowers, two or three times as many stamens as sepals or petals, a style which is not gynobasic, and the fruit which is a beakless, loculicidal capsule.

oxalite *See* humboldtine.

oxalosis [MED] A rare hereditary metabolic disorder, inherited as an autosomal recessive, in which glyoxylic acid metabolism is impaired, resulting in overproduction of oxalic acid and deposition of calcium oxalate in body tissues.

oxaluria [MED] The presence of oxalic acid or oxalates in the urine.

oxalyl chloride [INORG CHEM] $(COCl)_2$ Toxic, colorless liquid boiling at 64°C; soluble in ether, benzene, and chloroform; used as a chlorinating agent and for military poison gas. Also known as ethanedioyl chloride.

oxalylurea *See* parabanic acid.

oxamide [ORG CHEM] $NH_2COCONH_2$ Water-insoluble white powder, melting at 419°C; used as a stabilizer for nitrocellulose products.

Oxamycin [MICROBIO] A trade name for the antibiotic cycloserine.

oxatyl *See* carboxyl.

oxazole [ORG CHEM] C_3H_3ON A structure that consists of a five-membered ring containing oxygen and nitrogen in the 1 and 3 position; a colorless liquid (boiling point 69–70°C) that is miscible with organic solvents and water; used to prepare other organic compounds.

oxbow [HYD] **1.** A closely looping, U-shaped stream meander whose curvature is so extreme that only a neck of land remains between the two parts of the stream. Also known as horseshoe bend. **2.** *See* oxbow lake. [GEOL] The abandoned, horseshoe-shaped channel of a former stream meander after the stream formed a neck cutoff. Also known as abandoned channel.

oxbow lake [HYD] The crescent-shaped body of water located alongside a stream in an abandoned oxbow after a neck cutoff is formed and the ends of the original bends are silted up. Also known as crescentic lake; cutoff lake; horseshoe lake; loop lake; moat; mortlake; oxbow.

Oxfordian [GEOL] A European stage of geologic time, in the Upper Jurassic (above Callovian, below Kimmeridgean). Also known as Divesian.

Oxford unit [MICROBIO] The minimum quantity of penicillin which, when dissolved in 50 milliliters of a meat broth, is sufficient to inhibit completely the growth of a test strain of *Micrococcus aureus*; equivalent to the specific activity of 0.6 microgram of the master standard penicillin.

oxidase [BIOCHEM] An enzyme that catalyzes oxidation reactions by the utilization of molecular oxygen as an electron acceptor.

oxidate [GEOL] A sediment made up of iron and manganese oxides and hydroxides crystallized from aqueous solution.

oxidation [CHEM] **1.** A chemical reaction that increases the oxygen content of a compound. **2.** A chemical reaction in which a compound or radical loses electrons, that is in which the positive valence is increased.

oxidation number [CHEM] **1.** Numerical charge on the ions of an element. **2.** *See* oxidation state.

oxidation potential [PHYS CHEM] The difference in potential between an atom or ion and the state in which an electron has been removed to an infinite distance from this atom or ion.

oxidation-reduction indicator [ANALY CHEM] A compound whose color in the oxidized state differs from that in the reduced state.

oxidation-reduction potential *See* redox potential.

oxidation-reduction reaction [CHEM] An oxidizing chemical change, where an element's positive valence is increased (electron loss), accompanied by a simultaneous reduction of an associated element (electron gain).

oxidation state [CHEM] The number of electrons to be added (or subtracted) from an atom in a combined state to convert it to elemental form. Also known as oxidation number.

oxide [CHEM] Binary chemical compound in which oxygen is combined with a metal (such as Na_2O; basic) or nonmetal (such as NO_2; acidic).

oxide-coated cathode [ELECTR] A cathode that has been coated with oxides of alkaline-earth metals to improve electron emission at moderate temperatures.

oxide fuel reactor [NUCLEO] A nuclear fission reactor with fuel in the form UO_2 or PuO_2.

oxide mineral [MINERAL] A naturally occurring material in oxide form such as silicon dioxide, SiO_2, magnetite, Fe_3O_4, or lime, CaO.

oxide nuclear fuel [NUCLEO] The fissionable nuclear fuels UO_2 and PuO_2.

oxidized cellulose *See* oxycellulose.

oxidized microcrystalline wax [MATER] Refined, oxidized wax from bottoms of storage tanks for solvent-extracted petroleum; used in floor polishes.

oxidized shale *See* burnt shale.

oxidized zone [GEOL] A region of mineral deposits which has been altered by oxidizing surface waters.

oxidizing agent [CHEM] Compound that gives up oxygen easily, removes hydrogen from another compound, or attracts negative electrons.

oxidizing atmosphere [CHEM] Gaseous atmosphere in which an oxidation reaction occurs; usually refers to the oxidation of solids.

oxidizing flame [CHEM] A flame, or the portion of it, that contains an excess of oxygen.

oxidoreductase [BIOCHEM] An enzyme catalyzing a reaction in which two molecules of a compound interact so that one molecule is oxidized and the other reduced, with a molecule of water entering the reaction.

oxime [ORG CHEM] Compound containing the CH(:NOH)

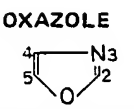
OWENIIDAE

Myriochele. *(a)* Entire ovigerous individual. *(b)* The tapering tube in which the mud-swallowing worm is securely contained.

OWL

Great horned owl *(Bubo virginianus)*, a nocturnal bird of prey.

OXAZOLE



Structure and numbering system for a representative oxazole, 1,3-oxazole.

RELATED PROCEEDINGS APPENDIX

None.